



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/660,777	09/12/2003	Osamu Saito	107355-00086	5766

7590 03/16/2006

ARENT FOX KINTNER PLOTKIN & KAHN, PLLC  
Suite 400  
1050 Connecticut Avenue, N.W.  
Washington, DC 20036-5339

EXAMINER

KLEBE, GERALD B

ART UNIT	PAPER NUMBER
----------	--------------

3618

DATE MAILED: 03/16/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	<b>Application No.</b> 10/660,777	<b>Applicant(s)</b> SAITO ET AL.	
	<b>Examiner</b> Gerald B. Klebe	<b>Art Unit</b> 3618	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

#### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) ☒ Responsive to communication(s) filed on 04 January 2006.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) ☒ Claim(s) 1 and 3-9 is/are pending in the application.
- 4a) Of the above claim(s) 2 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1 and 3-9 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 12 September 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \*    c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

*G.B. Klebe*  
11 March 2006

#### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)                        | 4) <input type="checkbox"/> Interview Summary (PTO-413)                     |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)               | Paper No(s)/Mail Date. _____  |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date <u>01/04/2006</u> .  | 6) <input type="checkbox"/> Other: _____                                    |

## DETAILED ACTION

### *Amendment*

1. The amendment filed 01/04/2006 under 37 CFR 1.111 has been entered. Claims 1 and 3-9 are pending in the application, claim 2 having been withdrawn from further consideration as reading on a non-elected species.

### *Claim Objections*

2. Claim 1 is objected to because of the following informalities: the colon in line 10 is improper; claims must be written in the form of one complete sentence. Appropriate correction is required.

### *Claim Rejections - 35 USC § 102*

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. Claims 1 and 5 are rejected under 35 U.S.C. 102(b) as being anticipated by Peters et al. (US 6425365).

Peters et al. discloses a hybrid vehicle comprising : (**re: claim 1**) an engine (Fig 1, item 12) for driving primary driving wheels (items W) via a transmission (17), the engine being able to be suspended from combustion (refer col 2, line 24-33; line 42-43; col 5, lines 14-23; line 30-33; col 5 line 67 to col 6 line 2; col 6, lines 15-20 and col 6, lines 29-39); a primary motor (14) disclosed between the engine and the transmission; a secondary motor (16) for driving one of the

Art Unit: 3618

primary driving wheels and the secondary driving wheels which are different from the primary driving wheels (refer col 3, lines 6-8 and col 3, lines 49-52) ; and, an electricity storage unit (36) connected to the primary and secondary motors (refer col 3, lines 21-25), wherein the vehicle is driven by the secondary motor while allowing the primary motor to perform a combustion suspended idle operation in which the engine which is being suspended from combustion is run idly by the primary motor according to driving conditions of the vehicle (refer col 5, lines 9-23); and, (**re: claim 5**) wherein at least either an inlet valve (VMV130; refer col 5, lines 44-47) or an exhaust valve (EGR150; refer col 5, lines 48-50) is held closed during the combustion suspended idle operation (refer col 5, lines 2-8 and lines 18-23).

***Claim Rejections - 35 USC § 103***

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 3-4 are rejected under 35 U.S.C. 103(a) as being unpatentable over Peters et al. (US 6425365).

a. As discussed above, Peters et al. discloses all of the limitations of claim 1 from which claims 3 and 4 depend.

b. Peters et al. lacks explicit disclosure (**re: claim 3**) wherein a rotational speed of the primary motor which is performing the combustion suspended idle operation is maintained at a rotational speed which can provide minimum friction on the engine; and, (**re: claim 4**) wherein

Art Unit: 3618

the combustion suspended idle operation is maintained at a rotational speed at which the engine can generate a predetermined oil pressure.

However, **(re: claim 3)** it would have been obvious to one having ordinary skill in the art at the time the instant invention was made to have provided that when the primary motor is spinning the engine with the cylinders deactivated (combustion suspended) a rotational speed would be selected that minimized engine friction since it was common knowledge in the art at the time that the instant invention was made that engine friction above self-cooling levels can cause the engine mass to reach temperatures that irreversibly damage engine components; and, **(re: claim 4)** it would have been obvious to one having ordinary skill in the art at the time the instant invention was made to have provided that when the primary motor is spinning the engine with cylinders deactivated (combustion suspended) a rotational speed would be selected that ensured the engine oil pump generated pressure levels of a predetermined amount that ensured that all moving components of the engine received lubrication since it was common knowledge in the art at the time the instant invention was made to maintain engine oil pressure above predetermined levels the ensured lubrication of all moving parts of the engine at any time the engine was rotating to prevent damage to the engine components.

7. Claims 6-9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Peters et al. (US 6425365) in view of Kuang et al. (US 6590299).

a. As discussed above, Peters et al. discloses all of the limitations of claim 1 from which claims 6-9 depend.

b. Peters et al. lacks explicit disclosure of any hill-holding feature of the system wherein **(re: claim 6)** the engine is started from the combustion-suspended idle operation based on an

Art Unit: 3618

inclination angle of the road surface and a residual capacity of the electricity storage unit; and (re: **claim 7**) wherein the engine is started up when the inclination angle of the road surface is equal to or larger than a first predetermined value and the residual capacity of the battery is less than a second predetermined value, so that the primary motor is driven by the engine as a generator and the secondary motor is driven by the electrical power generated to the primary motor to drive the vehicle; and (re: **claim 8**) wherein the engine is rotated by the primary motor with its combustion being suspended when the inclination angle of the road is equal to or larger than a first predetermined value and the residual capacity of the battery is equal to or larger than a second predetermined value, whereby the secondary motor is driven to generate a creeping force to prevent the reverse of the vehicle; and (re: **claim 9**) wherein the engine is started up when the reverse of the vehicle cannot be prevented by the creeping force generated by the secondary motor, and a lock current for preventing the reverse of the vehicle is supplied to the secondary motor.

c. However, Kuang et al. teaches a control strategy for a hybrid vehicle for hill-holding and creep capability which uses any one or all of the engine, primary motor/generator and secondary traction motor to achieve creep and hill-holding depending upon conditions of the vehicle drive system and electricity storage system and the inclination of the road surface. Refer to the reference at Figs 1-2, col 4, lines 1-3, 11- 19, 31-41, and 54-62, and further col 5, lines 6-17, and, as follows:

**Regarding the limitations of claim 6 as broadly claimed:** refer Kuang et al., col 2, lines 56-62. (As regards the further limitation of the claim of determining that a residual capacity exists in the electricity storage unit (battery) this is considered an inherent feature of any hybrid

Art Unit: 3618

vehicle control system that depends upon the battery to supply energy to the motor. Refer col 5, lines 13-17.)

**Regarding the limitations of claim 7 as broadly claimed:** refer Kuang et al., col 5, lines 35-40, lines 42-47, and lines 51-53, and col 6, lines 6-9. (As regards the further limitation of determining that a residual capacity exists in the electricity storage unit (battery) this is considered an inherent feature of any hybrid vehicle control system that depends upon the battery to supply energy to the motor. Refer col 5, lines 13-17.)

**Regarding the limitations of claim 8 as broadly claimed:** refer Kuang et al., col 4 lines 54-62. (Regarding the further limitation of determining that a residual capacity exists in the electricity storage unit (battery) this is considered an inherent feature of any hybrid vehicle control system that depends upon the battery to supply energy to the motor. Refer col 5, lines 13-17.)

**Regarding the limitations of claim 9 as broadly claimed:** refer Kuang et al., col 5, line 66 to col 6 line 6).

d. Therefore, it would have been obvious to one of ordinary skill in the art at the time the instant invention was made to have modified the hybrid vehicle drive system of Peters et al. to have hill-holding, creep and anti-reverse features in accordance with the teachings of Kuang et al. in order to provide hill-holding, vehicle creep and anti-reverse capabilities comparable to a conventional ICE vehicle with an automatic transmission while optimizing total power-train system efficiency and performance in various operating states of the system, as suggested by the reference at column 2, lines 30-34.

***Response to Arguments***

8. a. Applicant's arguments filed 01/04/2006 with respect to the reference due to Wakashiro et al. (US 6886649) as being disqualified as prior art against the claims is well-taken, Wakashiro et al. (-649) being subject to an obligation of assignment to the same entity at the time the instant invention was made. Therefore the rejections of claims 3-4 under 35 USC 103(a) and based upon the references to Peters (-365) and Wakashiro et al. have been removed.

b. Regarding the rejections of claims 1 and 5 under 35 USC 102(b) based on Peters et al. (US 6425365), Applicant argues that the vehicle in Peters et al. does not suspend combustion while the engine is spun by a motor, citing Peters et al. col 2, lines 19-33 and lines 47-49. The examiner disagrees.

Applicant's readings of Peters et al. at col 2, lines 19-33 and 47-49 are insufficient for proper understanding of Peters' controller; Fig. 3 and a thorough reading of the associated text, column 5, line 24 through col 6, line 39 demonstrates that firing of the spark plugs is discontinued after a predetermined period with the input valves VMV and exhaust output valve EGR remain closed, thereby ensuring no combustion unless the engine operational mode is changed by the control system, the engine being continued to be spun by the generator (motor) (14) until the engine rotational speed drops below a predetermined value (refer particularly to the rightmost portions of the graphs shown in Fig 3 and to the text at col 6, lines 29-39.

Consequently, Applicant's arguments notwithstanding, the rejections based on Peters et al. (-365) are as maintained herein above.



***Action made Final; New Grounds Necessitated by Amendment***

9. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

***Prior Art made of Record***

10. The prior art made of record and not relied upon is considered pertinent to Applicant's disclosure. The prior art of Hawkins et al.; of Boggs et al.; of Matsubara et al.; of Fuse et al.; of Chung et al.; of Takano et al.; of Collins et al.; of Shimabukuro et al.; of Hattori et al.; and of Ibaraki et al. each show features in common with some of the other structures of the inventive concept disclosed in the instant application.


***Conclusion***

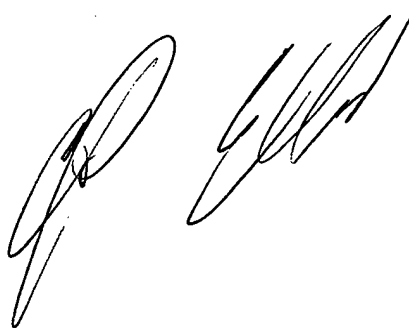
11. Any inquiry concerning this or earlier communication(s) from the examiner should be directed to Gerald B. Klebe at 571-272-6695; Mon.-Fri., 8:00 AM - 4:30 PM ET, or to Supervisory Patent Examiner Christopher P. Ellis, Art Unit 3618, at 571-272-6914.

Art Unit: 3618

Official correspondence should be sent to the following TC 3600 Official number as follows: 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

  
gbklebe / Art Unit 3618 / 12 March 2006



CHRISTOPHER P. ELLIS  
SUPERVISORY PATENT EXAMINER  
TECHNOLOGY CENTER 3600